Journal of Affective Disorders 294 (2021) 730–736

Contents lists available at ScienceDirect

Journal of Affective Disorders

journal homepage: www.elsevier.com/locate/jad

Research Paper

Depressed and excluded: Do depressive symptoms moderate recovery from ostracism?

Christiane M. Büttner [a,*], Selma C. Rudert [b], Rainer Greifeneder [a]

[a] University of Basel, Switzerland
[b] University of Koblenz and Landau, Germany

ARTICLE INFO

Keywords:
Depression
Depressive symptoms
Ostracism
Social exclusion
Recovery
Need satisfaction

ABSTRACT

Background: Prior studies show that depressed individuals react with more immediate reflexive need threat to ostracism than healthy controls. However, it remains unclear whether the observed difference between depressed individuals and healthy controls is caused by ostracism. To find out, the exclusion condition needs to be compared to a baseline condition: inclusion.

Methods: We assessed depressive symptoms in $N = 426$ participants in an experimental study. Participants were included or excluded in Cyberball and indicated both their immediate reflexive need satisfaction level and their reflective need satisfaction level several minutes later to assess recovery.

Results: Being excluded decreased reflexive need satisfaction levels for all participants. At the same time, the strength of depressive symptoms negatively predicted reflexive and reflective need satisfaction and was associated with slower recovery. Importantly, no moderation was observed: individuals with more depressive symptoms reported reduced need satisfaction levels regardless of being included or excluded in Cyberball.

Limitations: The present findings were obtained with one paradigm only, albeit the most commonly used one: Cyberball. Depressive symptoms were assessed as self-report; future studies may wish to replicate the effects using structured clinical interviews.

Conclusions: Depressive symptoms come with lowered need satisfaction levels, irrespective of whether individuals are socially excluded or included. Clinical practitioners should be aware of the relationship between chronic need threat and depression in order to help their patients overcome it.

1. Introduction

Ostracism, that is, being ignored and excluded by others, elicits strong feelings of pain (Eisenberger et al., 2003) and threatens fundamental human needs, such as the needs for self-esteem, belonging, control, and meaningful existence (Williams, 2009). Experiencing ostracism causes a wide range of aversive psychological consequences (Williams and Nida, 2011), including psychological and biological stress (e.g., Slavich et al., 2010). As a consequence, ostracized individuals may develop depressive symptoms over time (e.g., DeWall et al. 2012; Riva et al. 2016; Rudert et al. 2021). A vicious cycle can ensue, given that others may perceive depressed individuals as burdensome, which in turn can foster ostracism (Coyne, 1976; Rudert et al., 2021). Ultimately, ostracism may be causally connected to suicidal ideation and suicide attempts (Chen et al., 2020; Williams, 2009).

Prior studies investigating ostracism and depression have mainly focused on (a) depressive symptoms as a consequence of ostracism; and (b) how suffering from depression affects *immediate reflexive* reactions to an ostracism experience. However, little is known about whether depressive symptoms affect the *recovery* from ostracism, that is, how quickly individuals return to their prior level of need satisfaction following an exclusion experience. Additionally, previous studies investigating the reaction of individuals with depressive symptoms to ostracism experiences lacked an adequate control group that was not ostracized. Such a control group (usually termed *inclusion group,* reflecting the psychological counterpart to the ostracized *exclusion group*) is however necessary to find out whether individuals' reactions are specific to the exclusion situation, or rather reflect generalized tendencies that manifest across situations.

In the present contribution, we aim to close these gaps. We start by explaining how reactions to ostracism may differ over time according to the Temporal Need Threat Model (Williams, 2009), and then turn to

* Corresponding author.
E-mail address: c.buettner@unibas.ch (C.M. Büttner).

https://doi.org/10.1016/j.jad.2021.07.075
Received 29 March 2021; Received in revised form 16 July 2021; Accepted 17 July 2021
Available online 25 July 2021

previous findings on the relationship between depression and ostracism. We then present a study that investigates how depressive symptoms affect recovery from ostracism, using an inclusion group as a baseline control.

1.1. Temporal Need Threat Model of ostracism

According to the Temporal Need Threat Model of ostracism (Williams, 2009), reactions to ostracism can be grouped in three consecutive stages: the reflexive, the reflective, and the resignation stage.

In the *reflexive* stage—that is, as soon as ostracism is detected—individuals experience an immediate threat to their needs of belonging, self-esteem, control, and meaningful existence. This threat is strong and powerful for most people and generalizes across ostracism situations (Rudert and Greifeneder, 2016).

The *reflective* stage occurs in the minutes following the reflexive reactions, and marks the beginning of recovery from the aversive ostracism experience (Williams, 2009). Recovery from ostracism has been shown to depend on, for example, the availability of coping strategies (Eck et al., 2016). Further, cognitive mechanisms are argued to be particularly important during the reflective stage (Williams, 2009). It has also been shown that interindividual differences (e.g. self-construal or personality differences) moderate the reflective response (e.g., Eck et al. 2016; Ren et al. 2013; Williams, 2009).

Finally, if individuals experience prolonged ostracism, they may enter the so-called *resignation* stage, which is characterized by feelings of depression, helplessness, and estrangement (Riva et al., 2016; Williams, 2009). Consistent with the resignation stage's conceptual core, previous research established depressive symptoms as a consequence of prolonged experiences of ostracism (e.g., Chen et al. 2020; DeWall et al. 2012; Riva et al. 2016; Rudert et al. 2021).

The present contribution focusses on the first two stages, that is: the reflexive and the reflective stage. Specifically, we here investigate the role of depressive symptoms in how individuals recover from experiences of social exclusion in the reflective stage. It is plausible that depressive symptoms might act as a moderator in the reflective stage, thus influencing recovery: For instance, previous research showed that social anxiety moderates the reflective response to ostracism (Zadro et al., 2006) and social anxiety shows high comorbidity with depression (e.g., Adams et al., 2016). However, conclusions from anxiety to depression should be drawn with caution: Despite their high comorbidity, social anxiety and depression are distinct psychological conditions (e.g., Danneel et al., 2019; Fung et al., 2017), therefore more research is needed to determine if depressive symptoms may also moderate the reflective response to ostracism. Also, rumination about ostracism, a behavior characteristic for individuals with depressive symptoms (e.g., Mor and Winquist, 2002), has been found to impede recovery from ostracism (Wesselmann et al., 2013). Understanding recovery from ostracism may be of specific importance in clinical contexts, because the better an individual recovers from ostracism, the more likely they are to move on instead of entering a vicious cycle of rumination about the experience, thereby amplifying its negative impact (Wesselmann et al., 2013; Zadro et al., 2006). Focusing on reflective responses to ostracism and the speed of recovery also appears important from a practical perspective: As many variables that can attenuate the sting of ostracism unfold their power in the reflective stage (e.g., Ren et al., 2013; Williams, 2009), understanding factors that affect recovery from ostracism provides a particularly effective leverage to help those struggling after ostracism experiences.

1.2. Depression as a moderator of ostracism

Some prior research investigated how depression moderates reactions to ostracism. This research can be grouped into (a) studies on ostracism that investigate only the *reflexive* responses and without the use of inclusion groups (Jobst et al., 2015; Seidl et al., 2020), and (b) studies that investigate recovery from social experiences moderated by depressive levels, but focus on *rejection* rather than ostracism.

Regarding studies on reflexive responses, it has been shown that depressed patients react with more negative affect and higher *reflexive* (initial) need threat to ostracism compared to healthy controls (Jobst et al., 2015; Seidl et al., 2020). Aggravated responses were found for patients suffering from chronic depression (Jobst et al., 2015; Seidl et al., 2020), as well as episodic depression (Seidl et al., 2020). Unfortunately, both studies did not measure *reflective* responses, thus conclusions about recovery from ostracism cannot be made. Further, in neither of the studies were reactions of excluded participants compared to those of included participants. Thus, the studies do not allow to conclude that the effect of depressive symptomatology on need threat and mood indeed reflects an aggravated response of individuals with depressive symptoms to ostracism situations—or whether the effect is due to generalized tendencies of individuals with depressive symptoms that manifest across situations, resulting in a lower level of need satisfaction in *any* situation, regardless of the social experience.

While there is no conclusive evidence on the role of depressive symptoms in recovery from ostracism, interestingly, some evidence is available on recovery from rejection. Although *rejection* and *ostracism* are conceptually close phenomena (Wesselmann et al., 2019), rejection usually involves direct communication of not being welcome (e.g., Blackhart et al. 2009; Wesselmann et al. 2019), while ostracism may be better described as the absence of any communication or attention (Rudert et al., 2017; Wesselmann et al., 2019; Williams, 2009). While rejection and ostracism are not the same, evidence on rejection may nevertheless be suggestive of similar psychological processes operating in recovery from ostracism. To our knowledge, two studies show that depression moderates recovery from rejection (Hsu et al., 2015; Reijntjes et al., 2009). Reijntjes et al. (2009) show that children with more depressive symptoms recover more slowly from rejection. However, because of the focus on rejection, the results are only suggestive for ostracism and await formal testing. Additionally, the study examined children and children compared to adults may react differently to rejection or exclusion because their psychological development is not yet completed (Pharo et al., 2011; Rudert et al., 2020; Sebastian et al., 2010). Hsu et al. (2015) show that adults with major depressive disorder are more persistent in negative affect following rejection. Again, this study focused on rejection and not on exclusion (i.e., participants were told that a possible date partner did not like their social media profile). Further, the authors did not specify different stages following rejection measured in terms of need satisfaction, but rather looked at continuous effects on mood. In sum, the two studies point to a potential moderating role of depressive symptoms in recovery from social experiences, which we formally test in the present contribution.

Taken the prior evidence together, we see it as a valuable extension to test the effects of depressive symptoms on recovery from ostracism, not rejection, using the specified *reflexive* and *reflective* stages, in adults, and using an inclusion group as a control condition.

1.3. The present study

This paper examines depressive symptoms as a moderator of recovery from ostracism. We hypothesized that individuals with more

depressive symptoms compared to individuals with less depressive symptoms recover more slowly.[1]

We introduce two important extensions to the currently small body of existing research on depressive symptoms as a moderator of responses to ostracism: First, we measure both *reflexive*, as well as *reflective* responses to ostracism, which allows to test for differences in *recovery* from ostracism. Second, we compare reactions of excluded participants to those of included participants to assess whether participants' reactions are specific to the exclusion situation, or rather reflect generalized tendencies that result in lower need satisfaction levels in *any* situation.

2. Methods

2.1. Design and participants

All hypotheses, sample size, and exclusion criteria were preregistered (https://aspredicted.org/cb9c5.pdf). Verbatim material, all data, and analyses are available via https://osf.io/duap3/. We recruited participants online from Prolific Academic (UK residents only) to participate in a "study on social interactions" for a payment of £1.25 for approximately 10 minutes duration. To detect meaningful effect sizes of a small magnitude ($f^2 = 0.02$) with statistical power set to 0.80 and alpha error to 0.05, power analysis using G*Power (Faul et al., 2007) suggested a sample size of 395 individuals. We planned to oversample by 10%, resulting in a total of 435 participants, to ensure enough data points in case of drop-outs.

429 participants finished the study. Three participants wished to be excluded from data analysis, leaving a sample size of $N = 426$ participants (60.33% female, 1 diverse; $M_{age} = 35.92$, $SD = 12.80$, *Range* = 18−77 years). Participants were randomly assigned to one of two between-subjects experimental conditions of social experience (exclusion vs. inclusion in Cyberball).

2.2. Materials and procedure

Participants first indicated whether they already knew Cyberball, answered attention checks, and consented to participation. Participants proceeded to answer eight items measuring depressive symptoms in non-clinical contexts (Mohr and Müller, 2004). All items were translated to English and assessed on 7-point Likert scales (1 = never; 7 = always; e.g., *"There are many things that seem meaningless to me";* Cronbach's α = 0.86). Participants further answered the learned helplessness measure described in Footnote 1.

Next, participants played Cyberball, a ball tossing game with two other ostensible players (Williams and Jarvis, 2006) that are in fact pre-programmed. Participants in the inclusion condition received an equal share of ball throws. Participants in the exclusion condition received the ball three times in the beginning of the game and then never again.

After the Cyberball game, all participants indicated their *reflexive* need satisfaction during the game, with four items on 9-point Likert scales (Rudert and Greifeneder, 2016; e.g., "During the game I felt… 1 = rejected; 9 = accepted.;" Cronbach's α = 0.96).

To allow time for the transition between the reflexive and the reflective stage, we introduced a filler task (Williams, 2009; Zadro et al., 2006). All participants saw 15 pairs of photos of objects taken from the Open Affective Standardized Image Set (OASIS; (Kurdi et al., 2017). For every pair, participants indicated which of the two photos they liked best. According to the OASIS, all used photos were neutral in valence (i.e., between 3.5 and 4.5 on a scale from 1 = very negative to 7 = very positive) and non-arousing (i.e., less than 2.5 scale points on a scale from 1 = very low arousal to 7 = very high arousal).

After the two minutes filler task, participants answered the same four items as before, but now framed to assess *reflective* need satisfaction (e.g., "Right now, I feel… 1 = rejected; 9 = accepted;" Cronbach's α = 0.93). Finally, participants provided demographic information, and, as manipulation checks for Cyberball, indicated how much they actively participated in the ball tossing (1 = not at all, 5 = very much), and how many ball throws they had received (in percent). All participants were debriefed, thanked, and compensated via Prolific.

3. Results

For all analyses, we report Cohen's *d*s as indicators of effect size for t-tests and unstandardized regression coefficients *b* and η_p^2 as indicators of effect size for regression analyses.

3.1. Manipulation checks

Reflecting a successful manipulation, participants reported less active participation in Cyberball in the exclusion compared to the inclusion condition, $t(397.74) = -25.29$, $p < .001$, $d = -2.45$ ($M_{Exclusion} = 2.29$, $SD = 0.97$ vs. $M_{Inclusion} = 4.41$, $SD = 0.74$), and receiving fewer ball throws, $t(341.45) = -42.62$, $p < .001$, $d = -4.13$ ($M_{Exclusion} = 6.60$, $SD = 4.25$ vs. $M_{Inclusion} = 31.08$, $SD = 7.21$).

3.2. Main effects of ostracism

Being excluded compared to included significantly lowered both *reflexive* need satisfaction during Cyberball, $t(388.16) = -26.83$, $p < .001$, $d = -2.60$ ($M_{Exclusion} = 2.35$, $SD = 1.26$ vs. $M_{Inclusion} = 6.24$, $SD = 1.70$), and *reflective* need satisfaction a few minutes later, $t(423.38) = -3.65$, $p < .001$, $d = -0.35$ ($M_{Exclusion} = 5.70$, $SD = 1.70$ vs. $M_{Inclusion} = 6.29$, $SD = 1.62$). Consistent with preregistration, we computed a difference recovery score by subtracting *reflexive* need satisfaction from *reflective* need satisfaction. Positive values indicate recovery and negative values indicate deterioration of need satisfaction compared to the reflexive measurement. As expected, we observed recovery, which was significantly stronger in the exclusion compared to the inclusion condition, $t(410.77) = 19.10$, $p < .001$, $d = 1.85$ ($M_{Exclusion} = 3.35$, $SD = 1.95$ vs. $M_{Inclusion} = 0.05$, $SD = 1.61$).

3.3. Depression as a moderator

Depression scores were centered around the mean, $M = 3.65$, $SD = 1.16$, and did not differ between the social experience conditions, $p = .129$. We first look at depressive symptoms as a moderator of *reflexive* need satisfaction, followed by depressive symptoms as a moderator of *reflective* need satisfaction. Finally, we look at depressive symptoms as a moderator of recovery (i.e., the difference score of *reflective minus reflexive* need satisfaction).

First, for *reflexive* need satisfaction, there was a significant main effect of social experience, $b = 3.79$, $t(422) = 7.94$, $p < .001$, $\eta_p^2 = 0.64$, and of depressive symptoms, $b = -0.17$, $t(422) = -2.77$, $p = .006$, $\eta_p^2 = 0.02$, but no significant interaction of social experience and depressive symptoms, $b = 0.03$, $t(422) = 0.28$, $p = .782$, $\eta_p^2 < 0.01$.

For *reflective* need satisfaction, we observed again a significant effect of depressive symptoms, $b = -0.52$, $t(422) = -8.00$, $p < .001$, $\eta_p^2 = 0.13$. In contrast to the reflexive measure, however, there was no significant main effect of social experience, $b = 0.64$, $t(422) = 1.29$, $p = .198$, $\eta_p^2 = 0.05$, suggesting that participants fully recovered from ostracism by the

[1] We also investigated and preregistered learned helplessness as a potential moderator of recovery from ostracism, measured with the four items learned helplessness subscale of the Depressive Attributions Questionnaire (DAQ; Kleim et al., 2011). However, consistent with the literature, depression and learned helplessness were highly correlated ($r = .70$, $p < .001$) and the results for the learned helplessness moderator were practically identical to the results of the depression moderator. Therefore, and for reasons of simplicity, we here focus on depression and report the learned helplessness analyses online via https://osf.io/duap3/?view_only=65979f0287ea4d15ad76fb3c5214cde6.

time of the reflective measurement (see Fig. 1). Importantly, once again there was no significant interaction of social experience and depressive symptoms, $b = 0.01$, $t(422) = 0.07$, $p = .947$, $\eta_p^2 < 0.01$.

Overall, the two main effects of depressive symptoms and the non-significant interaction effects with social experience suggest that individuals with more depressive symptoms experience less need satisfaction but that this is independent of whether they were included or excluded from the Cyberball game. This notion is further supported by the analysis of the *recovery* score: For recovery, there was again a significant main effect of social experience, $b = -3.15$, $t(422) = -5.61$, $p < .001$, $\eta_p^2 = 0.46$, and of depressive symptoms, $b = -0.35$, $t(422) = -4.75$, $p < .001$, $\eta_p^2 = 0.05$, but no significant interaction, $b = -0.03$, $t(422) = -0.18$, $p = .861$, $\eta_p^2 < 0.01$ (see Fig. 2).

4. Discussion

Consistent with prior findings (Jobst et al., 2015; Seidl et al., 2020), the present research shows that individuals with more depressive symptoms experience stronger threats to the four fundamental needs of belonging, self-esteem, meaningful consistence, and control. At the same time, the present research sets earlier findings in a new light by assessing threats to need satisfaction not only for excluded individuals, but also for included individuals, thereby affording a critical comparison standard.

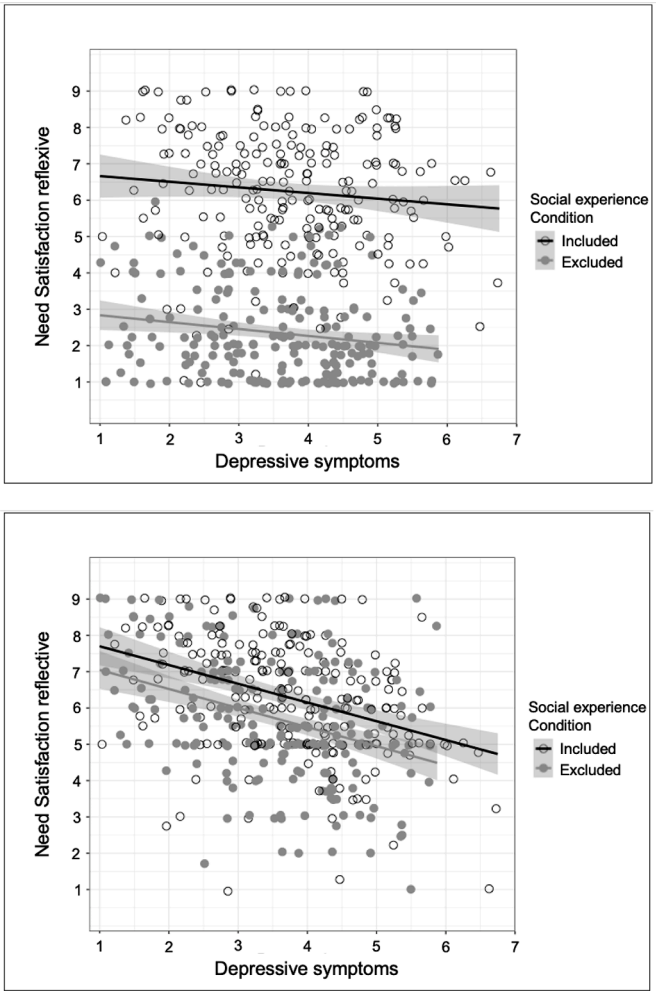

Fig. 1. Need satisfaction reflexive (upper graph) and reflective (lower graph) by social experience condition, moderated by depressive symptoms.
Note: Light gray areas represent standard errors. Higher values on the y-axis reflect higher need satisfaction. Higher values on the x-axis reflect more depressive symptoms.

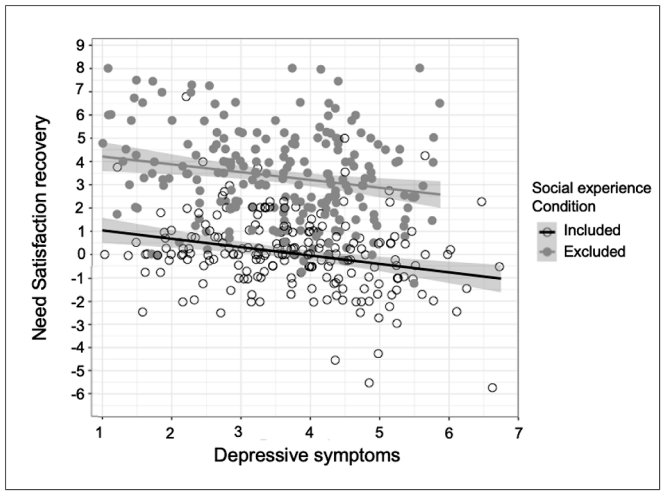

Fig. 2. Need satisfaction recovery by social experience condition, moderated by depressive symptoms.
Note: Light gray areas represent standard errors. Positive values on the y-axis indicate recovery, negative values on the y-axis indicate deterioration of need satisfaction compared to the reflexive measurement. Higher values on the x-axis reflect more depressive symptoms.

This comparison standard shows that the negative association between depressive symptoms and need satisfaction is not specific to being socially excluded, but extends to both social exclusion and social inclusion. This grants the important insight that individuals with more depressive symptoms report generally lower need satisfaction levels and not a more intense reaction to ostracism.

The present study further extends prior research by measuring need satisfaction twice, once immediately after participants had played Cyberball (*reflexive* stage), and once several minutes later (*reflective* stage). Focusing on recovery in addition to immediate reactions may be especially relevant since the recovery from ostracism may be improved, for example with adequate coping strategies (Eck et al., 2016). Thus, clinical and health professionals can advise their patients to engage in effective coping and re-affiliation strategies following social exclusion experiences.

The dual needs measurement grants insights into short term recovery: While the measurement shows that all participants had recovered during the short two-minute period between the reflexive and the reflective measurement, recovery was less pronounced the stronger the depressive symptomatology was. This finding conceptually dovetails with prior research on rejection suggesting slower recovery from rejection for individuals with more depressive symptoms (Hsu et al., 2015; Reijntjes et al., 2009). While ostracism and rejection have many aspects in common, being ostracized has been shown to have more aversive effects than being rejected (e.g., Wesselmann et al. 2019), For example, being ignored lowers reflective needs more than being rejected in a friendly, neutral, or even hostile manner, suggesting that any kind of acknowledgment matters (Rudert et al., 2017). Another study supports this notion by showing that being ignored lowers needs more than being argued with (Zadro et al., 2005). Further evidence stems from social media research: Receiving dislikes (i.e. being rejected on social media) lowers different needs than not receiving any reaction on social media (Lutz and Schneider, 2020).

4.1. Limitations

The present study is also subject to limitations. First, this study only uses one experimental paradigm, Cyberball—albeit the most commonly used paradigm in earlier studies concerning depression and other psychiatric disorders as moderators in ostracism scenarios (e.g. Reinhard et al. 2020; Seidl et al. 2020). The use of only one paradigm, particularly

Cyberball, has been criticized for its lack of ecological validity, for example because real-world experiences of ostracism may be more ambiguous and subtle than exclusion in Cyberball (cf. Wesselmann et al. 2019). Additionally, a recent meta-analysis (Hartgerink et al., 2015) found that the Cyberball paradigm has been predominantly used within Western samples so that more knowledge is required about potential cultural differences. In the present context, speculations about cultural differences that might influence responses of individuals with depressive symptoms to ostracism have to be treated with caution. Such cultural differences might be expected because, for instance, the effects of victimization on depression differ based on individuals' cultural background (e.g., Yuchang et al., 2019) and having a history of victimization has been found to accentuate reactions to being excluded (Ruggieri et al., 2013). Future studies should mend this gap by investigating samples from different cultural backgrounds and replicating the present findings using other exclusion scenarios. For example, future studies could use exclusion paradigms with more immersive contexts like ostensible group tasks (e.g., Rudert et al. 2020), chat paradigms (e.g., Rudert et al. 2018), or false feedback manipulations (e.g., Baumeister et al. 2002), to avoid method biases and to probe for generalization across social exclusion contexts (e.g., Rudert et al. 2021), including factors such as the relationship with the excluding group (e.g., Gonsalkorale and Williams, 2007; Nezlek et al. 2012), present observers (e.g., Hales et al. 2021), or available coping mechanisms (cf. Eck et al. 2016).

Another possibility would be to use recall paradigms where participants recall a time where they have been excluded (e.g., Chen et al. 2012; Jiang et al. 2020). This manipulation could also be tailored to exclusion experiences that individuals with depressive symptoms typically make in their everyday life, such as not being invited to events because their symptoms and interpersonal behavior may be experienced as burdensome by others (e.g., Baddeley et al. 2013; Coyne, 1976; Potthoff et al. 1995; Rudert et al. 2021; Wesselmann et al. 2013). Moreover, individuals with depressive symptoms may be particularly prone to certain exclusion experiences such as the experience of so-called cold comfort, where others insensitively invalidate the feelings of the depressed person in attempts of social support (e.g., cold comfort would be saying that the person has nothing to be sad about; e.g., Burleson 2003; Coyne et al. 1988; Holmstrom et al. 2005; Wesselmann et al. 2019). Paradigms that tap into such exclusion experiences that may be particularly relevant for individuals with depressive symptoms could be more suitable to show a moderating effect of depressive symptoms on responses to ostracism.

Regarding the use of different ostracism manipulations in general, it should be noted, however, that prior social exclusion research generally observed very similar effects across manipulations (e.g., Rudert et al. 2018; 2020; Wesselmann et al. 2019), and that by using Cyberball, the present study connects to a plethora of studies conducted in the social, clinical, and neuroscience literature (e.g., Eisenberger et al. 2003; Euler et al. 2018; Hartgerink et al. 2015).

Another possible caveat of the present study is that we used self-reports to measure depressive symptoms, possibly with associated recall and self-presentational biases. Future research may wish to complement the present findings with structured clinical interviews to assess depression levels. However, prior research shows that self-reports and clinical diagnoses are strongly correlated (e.g., Stuart et al. 2014), suggesting that the self-report measure may provide reliable insights.

Notably, we focused on individuals with subclinical levels of depressive symptomatology. Opting for this population appeared commendable for several reasons: Using a non-clinical sample provided us with the possibility to run an adequately powered study and increased the results' reliability. The extension to non-clinical samples also broadens the findings' external applicability to a larger number of individuals with depressive symptoms (i.e., the strong number of individuals struggling with non-diagnosed subclinical levels of depression). This may prove particularly important, given that subclinical levels of depression pose a significant risk factor for developing major depressive disorder (e.g., Kessler et al. 1997). Nevertheless, future studies may wish to extend and replicate the present findings by comparing patients with a clinically diagnosed depression to healthy controls. Further, it could be interesting to test the effects of being included or excluded on individuals with severe and less severe forms of depression, such as chronic depression and episodic depression. Potentially, individuals with stronger depressive symptoms may also be at a higher risk for making exclusion experiences in their everyday life, because they may be perceived as more burdensome by others (e.g., Rudert et al. 2021; Wesselmann et al. 2013). Therefore, excluded patients with chronic depression may react with more need threat compared to included patients with chronic depression or patients with less severe depressive symptoms.

4.2. Implications

The present contribution demonstrates that depressive symptomatology threatens fundamental needs of belonging, self-esteem, meaningful existence, and control across social experience conditions. This has important implications for theory in both clinical and social psychology, as well as for clinical and health practitioners working with depressed or at-risk for depression individuals.

The present results advance the literature on social exclusion as a risk factor fostering the development and persistence of depressive symptomatology and comorbid psychiatric disorders (Reinhard et al., 2020). Interestingly, the similarity in individuals with depressive symptoms reactions to exclusion and inclusion may reflect several underlying processes, which may be fruitfully explored in future research: One possible explanation holds that individuals with depressive symptoms do react more intensely to ostracism, but that they are also not able to derive need satisfaction from inclusion into a group. Alternatively, it is also possible that the pattern of results may be attributed to specific symptoms of depression, such as a lack of emotional responsiveness, that then lower need satisfaction in general. Overall, the present findings illustrate how essential it is to employ inclusion groups as a control when investigating effects of social exclusion, as conclusions about specific reactions to exclusion are best understood in the context of suitable control conditions.

Although depressive symptoms are comorbid to other psychiatric disorders (e.g., Steffen et al. 2020), and thus highly relevant, the present data does not allow for statements for other diagnostic groups. Therefore, future studies should aim to extend the present findings by comparing reactions to inclusion and exclusion in different diagnostic groups to healthy controls. For example, prior research demonstrated that borderline personality patients react with more need threat to ostracism (e.g., Gratz et al. 2013; Jobst et al. 2014; Reinhard et al. 2020; Seidl et al. 2020), and, similar to our findings, they experience less need satisfaction after both exclusion and inclusion in Cyberball compared to healthy controls (Euler et al., 2018). Yet, to our knowledge, findings that go beyond *reflexive* reactions and directly compare borderline patients' *recovery* following exclusion compared to inclusion and compared to healthy controls are yet missing.

Finally clinical and health professionals may be well-advised to work with their patients to overcome chronic need threat, for example with interventions targeting self-esteem, or by strengthening belongingness via social support in group therapies or self-help groups. Even though the lower need satisfaction of individuals with more depressive symptoms was not specific to the exclusion situation, we would like to emphasize the importance for practitioners in psychotherapy and counselling to be particularly attentive to depressive symptoms with ostracized clients, and to invariably address the risk of being ostracized for clients with depressive symptoms. After all, the additive effects of exclusion for depressed individuals' need satisfaction levels may have severe consequences, for instance, fostering suicidal ideation and suicide attempts (e.g., Chen et al. 2020; Williams, 2009). Additionally, given the increased risk for depressed individuals to be ostracized (e.g., Reinhard

et al. 2020) and the likelihood of developing depressive symptoms in response to prolonged ostracism (e.g., Rudert et al. 2021), a potentially vicious cycle of chronic need threat and depression may ensue that calls for clinical and health practitioners to help their ostracized and/or depressed patients to overcome it.

5. Conclusion

The present study sought to clarify an important question in both social and clinical psychology: Do depressive symptoms moderate recovery from ostracism? Different from prior research, the study compared inclusion and exclusion, granting a significant insight: Depressive symptoms are associated with lower need satisfaction, yet, this main effect is not specific to ostracism, but is observed in inclusion situations, too. This finding has important implications for theory in social and clinical psychology as well as for clinical and health practitioners.

Role of the funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Christiane M. Büttner: Visualization, Formal analysis, Writing – review & editing. **Selma C. Rudert:** Visualization, Writing – review & editing. **Rainer Greifeneder:** Visualization, Writing – review & editing.

Declaration of Competing Interest

The authors report no conflict of interests.

Acknowledgment

We would like to thank Florian Stieber for providing language help. We would also like to thank Anna-Marie Bertram and Nina Frings for their assistance with designing and implementing the study.

References

Adams, G.C., Balbuena, L., Meng, X., Asmundson, G.J.G., 2016. When social anxiety and depression go together: a population study of comorbidity and associated consequences. J. Affect. Disord. 206, 48–54. https://doi.org/10.1016/j.jad.2016.07.031.

Baddeley, J.L., Pennebaker, J.W., Beevers, C.G., 2013. Everyday social behavior during a major depressive episode. Soc. Psychol. Personal. Sci. 4 (4), 445–452. https://doi.org/10.1177/1948550612461654.

Baumeister, R.F., Twenge, J.M., Nuss, C.K., 2002. Effects of social exclusion on cognitive processes: anticipated aloneness reduces intelligent thought. J. Pers. Soc. Psychol. 83 (4), 817–827. https://doi.org/10.1037/0022-3514.83.4.817.

Blackhart, G.C., Nelson, B.C., Knowles, M.L., Baumeister, R.F., 2009. Rejection elicits emotional reactions but neither causes immediate distress nor lowers self-esteem: a meta-analytic review of 192 studies on social exclusion. Personal. Soc. Psychol. Rev. 13 (4), 269–309. https://doi.org/10.1177/1088868309346065.

Burleson, B.R., 2003. Emotional support skill. In: Greene, O., Burleson, B.R. (Eds.), Handbook of Communication and Social Interaction Skills. Erlbaum, pp. 551–594.

Chen, Z., DeWall, C.N., Poon, K.T., Chen, E.W., 2012. When destiny hurts: implicit theories of relationships moderate aggressive responses to ostracism. J. Exp. Soc. Psychol. 48 (5), 1029–1036. https://doi.org/10.1016/j.jesp.2012.04.002.

Chen, Z., Poon, K.T., DeWall, C.N., Jiang, T., 2020. Life lacks meaning without acceptance: ostracism triggers suicidal thoughts. J. Pers. Soc. Psychol. 119 (6), 1423–1443. https://doi.org/10.1037/pspi0000238.

Coyne, J.C., 1976. Toward an interactional description of depression. Psychiatry 39 (1), 28–40. https://doi.org/10.1080/00332747.1976.11023874.

Coyne, J.C., Wortman, C.B., Lehman, D.R., 1988. The other side of support: emotional overinvolvement and miscarried helping. In: Gottlieb, B.H. (Ed.), Marshaling Social Support: Formats, Processes, and Effects. Sage Publications, Inc, pp. 305–330.

Danneel, S., Bijttebier, P., Bastin, M., Colpin, H., Van den Noortgate, W., Van Leeuwen, K., Verschueren, K., Goossens, L., 2019. Loneliness, social anxiety, and depressive symptoms in adolescence: examining their distinctiveness through factor analysis. J. Child Fam. Stud. 28 (5), 1326–1336. https://doi.org/10.1007/s10826-019-01354-3.

DeWall, C.N., Gilman, R., Sharif, V., Carboni, I., Rice, K.G., 2012. Left out, sluggardly, and blue: low self-control mediates the relationship between ostracism and depression. Pers. Individ. Differ. 53 (7), 832–837. https://doi.org/10.1016/j.paid.2012.05.025.

Eck, J., Schoel, C., Greifeneder, R, 2016. Coping with or buffering against the negative impact of social exclusion on basic needs: a review of strategies. In: Riva, P., Eck, J. (Eds.), Social Exclusion. Springer International Publishing, pp. 227–249. https://doi.org/10.1007/978-3-319-33033-4_11.

Eisenberger, N.I., Lieberman, M.D., Williams, K.D., 2003. Does rejection hurt? An fMRI study of social exclusion. Science 302 (5643), 290–292. https://doi.org/10.1126/science.1089134.

Euler, S., Wrege, J., Busmann, M., Lindenmeyer, H.J., Sollberger, D., Lang, U.E., Gaab, J., Walter, M., 2018. Exclusion-proneness in borderline personality disorder inpatients impairs alliance in mentalization-based group therapy. Front. Psychol. 9, 824. https://doi.org/10.3389/fpsyg.2018.00824. Articlehttps://doi.org/.

Faul, F., Erdfelder, E., Lang, A.G., Buchner, A., 2007. G*Power 3: a flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behav. Res. Methods 39 (2), 175–191. https://doi.org/10.3758/BF03193146.

Fung, K., Paterson, D., Alden, L.E., 2017. Are social anxiety and loneliness best conceptualized as a unitary trait? J. Soc. Clin. Psychol. 36 (4), 335–345. https://doi.org/10.1521/jscp.2017.36.4.335.

Gonsalkorale, K., Williams, K.D., 2007. The KKK won't let me play: ostracism even by a despised outgroup hurts. Eur. J. Soc. Psychol. 37 (6), 1176–1186. https://doi.org/10.1002/ejsp.392.

Gratz, K.L., Dixon-Gordon, K.L., Breetz, A., Tull, M., 2013. A laboratory-based examination of responses to social rejection in borderline personality disorder: the mediating role of emotion dysregulation. J. Pers. Disord. 27 (2), 157–171. https://doi.org/10.1521/pedi.2013.27.2.157.

Hales, A.H., McIntyre, M.M., Rudert, S.C., Williams, K.D., Thomas, H., 2021. Ostracized and observed: the presence of an audience affects the experience of being excluded. Self Ident. 20 (1), 94–115. https://doi.org/10.1080/15298868.2020.1807403.

Hartgerink, C.H.J., van Beest, I., Wicherts, J.M., Williams, K.D., 2015. The ordinal effects of ostracism: a meta-analysis of 120 Cyberball studies. PLoS ONE 10 (5), e0127002. https://doi.org/10.1371/journal.pone.0127002.

Holmstrom, A.J., Burleson, B.R., Jones, S.M., 2005. Some consequences for helpers who deliver "cold comfort": why it's worse for women than men to be inept when providing emotional support. Sex Roles 53 (3–4), 153–172. https://doi.org/10.1007/s11199-005-5676-4.

Hsu, D.T., Sanford, B.J., Meyers, K.K., Love, T.M., Hazlett, K.E., Walker, S.J., Mickey, B. J., Koeppe, R.A., Langenecker, S.A., Zubieta, J.K., 2015. It still hurts: altered endogenous opioid activity in the brain during social rejection and acceptance in major depressive disorder. Mol. Psychiatry 20 (2), 193–200. https://doi.org/10.1038/mp.2014.185.

Jiang, T., Chen, Z., Wang, S., Hou, Y., 2020. Ostracism disrupts self-continuity. Personal. Soc. Psychol. Bull. https://doi.org/10.1177/0146167220974496, 0146167220974496https://doi.org/.

Jobst, A., Albert, A., Bauriedl-Schmidt, C., Mauer, M.C., Renneberg, B., Buchheim, A., Sabass, L., Falkai, P., Zill, P., Padberg, F., 2014. Social exclusion leads to divergent changes of oxytocin levels in borderline patients and healthy subjects. Psychother. Psychosom. 83 (4), 252–254. https://doi.org/10.1159/000358526.

Jobst, A., Sabass, L., Palagyi, A., Bauriedl-Schmidt, C., Mauer, M.C., Sarubin, N., Buchheim, A., Renneberg, B., Falkai, P., Zill, P., Padberg, F., 2015. Effects of social exclusion on emotions and oxytocin and cortisol levels in patients with chronic depression. J. Psychiatry Res. 60, 170–177. https://doi.org/10.1016/j.jpsychires.2014.11.001.

Kessler, R.C., Zhao, S., Blazer, D.G., Swartz, M., 1997. Prevalence, correlates, and course of minor depression and major depression in the national comorbidity survey. J. Affect. Disord. 45 (1–2), 19–30. https://doi.org/10.1016/S0165-0327(97)00056-6.

Kleim, B., Gonzalo, D., Ehlers, A., 2011. The Depressive Attributions Questionnaire (DAQ): development of a short self-report measure of depressogenic attributions. J. Psychopathol. Behav. Assess. 33 (3), 375–385. https://doi.org/10.1007/s10862-011-9234-9.

Kurdi, Benedek, Lozano, Shayn, Banaji, Mahzarin R., 2017. Introducing the Open Affective Standardized Image Set (OASIS). Behavior Research Methods 49 (2), 457–470. https://doi.org/10.3758/s13428-016-0715-3.

Lutz, S., Schneider, F.M., 2020. Is receiving Dislikes in social media still better than being ignored? The effects of ostracism and rejection on need threat and coping responses online. Media Psychol 1–25. https://doi.org/10.1080/15213269.2020.1799409.

Mohr, G., Müller, A., 2004. Depressivität im nichtklinischen Kontext. Zs. Sozialwissensch. Items Skalen (ZIS). https://doi.org/10.6102/ZIS79.

Mo r, N., Winquist, J., 2002. Self-focused attention and negative affect: a meta-analysis. Psychol. Bull. 128 (4), 638–662. https://doi.org/10.1037/0033-2909.128.4.638.

Nezlek, J.B., Wesselmann, E.D., Wheeler, L., Williams, K.D., 2012. Ostracism in everyday life. Group Dyn. Theory Res. Pract. 16 (2), 91–104. https://doi.org/10.1037/a0028029.

Pharo, H., Gross, J., Richardson, R., Hayne, H., 2011. Age-related changes in the effect of ostracism. Soc. Influ. 6 (1), 22–38. https://doi.org/10.1080/15534510.2010.525852.

Potthoff, J.G., Holahan, C.J., Joiner, T.E., 1995. Reassurance seeking, stress generation, and depressive symptoms: an integrative model. J. Pers. Soc. Psychol. 68 (4), 664–670. https://doi.org/10.1037/0022-3514.68.4.664.

Reijntjes, A., Dekovic, M., Vermande, M., Telch, M.J., 2009. Role of depressive symptoms in early adolescents' online emotional responding to a peer evaluation challenge. Depress. Anxiety 26 (2), 135–146. https://doi.org/10.1002/da.20446.

Reinhard, M.A., Dewald-Kaufmann, J., Wüstenberg, T., Musil, R., Barton, B.B., Jobst, A., Padberg, F., 2020. The vicious circle of social exclusion and psychopathology: a systematic review of experimental ostracism research in psychiatric disorders. Eur. Arch. Psychiatry Clin. Neurosci. 270 (5), 521–532. https://doi.org/10.1007/s00406-019-01074-1.

Ren, D., Wesselmann, E.D., Williams, K.D., 2013. Interdependent self-construal moderates coping with (but not the initial pain of) ostracism. Asian. J. Soc. Psychol. 16 (4), 320–326. https://doi.org/10.1111/ajsp.12037.

Riva, P., Montali, L., Wirth, J.H., Curioni, S., Williams, K.D., 2016. Chronic social exclusion and evidence for the resignation stageresignation stage: an empirical investigation. J. Soc. Pers. Relat. 34 (4), 541–564. https://doi.org/10.1177/0265407516644348.

Rudert, S.C., Greifeneder, R., 2016. When it's okay that I don't play: social norms and the situated construal of social exclusion. Personal. Soc. Psychol. Bull. 42 (7), 955–969. https://doi.org/10.1177/0146167216649606.

Rudert, S.C., Hales, A.H., Büttner, C.M., 2021a. Stay out of our office (vs. our pub): target personality and situational context affect ostracism intentions. J. Exp. Soc. Psychol. 95 https://doi.org/10.1016/j.jesp.2021.104142.

Rudert, S.C., Hales, A.H., Greifeneder, R., Williams, K.D., 2017. When silence is not golden: why acknowledgment matters even when being excluded. Personal. Soc. Psychol. Bull. 43 (5), 678–692. https://doi.org/10.1177/0146167217695554.

Rudert, S.C., Janke, S., Greifeneder, R., 2020a. The experience of ostracism over the adult life span. Dev. Psychol. 56 (10), 1999–2012. https://doi.org/10.1037/dev0001096.

Rudert, S.C., Janke, S., Greifeneder, R., 2021b. Ostracism breeds depression: longitudinal associations between ostracism and depression over a three-year-period. J. Affect. Disord. Rep. Adv. Online Publ. https://doi.org/10.1016/j.jadr.2021.100118.

Rudert, S.C., Keller, M.D., Hales, A.H., Walker, M., Greifeneder, R., 2020b. Who gets ostracized? A personality perspective on risk and protective factors of ostracism. J. Pers. Soc. Psychol. 118 (6), 1247–1268. https://doi.org/10.1037/pspp0000271.

Rudert, S.C., Sutter, D., Corrodi, V.C., Greifeneder, R., 2018. Who's to blame? Dissimilarity as a cue in moral judgments of observed ostracism episodes. J. Pers. Soc. Psychol. 115 (1), 31–53. https://doi.org/10.1037/pspa0000122.

Ruggieri, S., Bendixen, M., Gabriel, U., Alsaker, F., 2013. Do victimization experiences accentuate reactions to ostracism? An experiment using Cyberball. Int. J. Dev. Sci. 7 (1), 25–32. https://doi.org/10.3233/DEV-1312114.

Sebastian, C., Viding, E., Williams, K.D., Blakemore, S.J., 2010. Social brain development and the affective consequences of ostracism in adolescence. Brain Cognit. 72 (1), 134–145. https://doi.org/10.1016/j.bandc.2009.06.008.

Seidl, E., Padberg, F., Bauriedl-Schmidt, C., Albert, A., Daltrozzo, T., Hall, J., Renneberg, B., Seidl, O., Jobst, A., 2020. Response to ostracism in patients with chronic depression, episodic depression and borderline personality disorder a study using Cyberball. J. Affect. Disord. 260, 254–262. https://doi.org/10.1016/j.jad.2019.09.021.

Slavich, G.M., O'Donovan, A., Epel, E.S., Kemeny, M.E., 2010. Black sheep get the blues: a psychobiological model of social rejection and depression. Neurosci. Biobehav. Rev. 35 (1), 39–45. https://doi.org/10.1016/j.neubiorev.2010.01.003.

Steffen, A., Nübel, J., Jacobi, F., Bätzing, J., Holstiege, J., 2020. Mental and somatic comorbidity of depression: a comprehensive cross-sectional analysis of 202 diagnosis groups using German nationwide ambulatory claims data. BMC Psychiatry 20 (1), 142. https://doi.org/10.1186/s12888-020-02546-8.

Stuart, A.L., Pasco, J.A., Jacka, F.N., Brennan, S.L., Berk, M., Williams, L.J., 2014. Comparison of self-report and structured clinical interview in the identification of depression. Comp. Psychiatry 55 (4), 866–869. https://doi.org/10.1016/j.comppsych.2013.12.019.

In Wesselmann, E.D., Michels, C., Slaughter, A., 2019. Understanding common and diverse forms of social exclusion. In: Rudert, S.C., Greifeneder, R., Williams, K.D. (Eds.), Current Directions in Ostracism, Social Exclusion, and Rejection Research. Routledge, pp. 1–18.

Wesselmann, E.D., Ren, D., Swim, E., Williams, K.D., 2013a. Rumination hinders recovery from ostracism. Int. J. Dev. Sci. 7 (1), 33–39. https://doi.org/10.3233/DEV-1312115.

Wesselmann, E.D., Wirth, J.H., Pryor, J.B., Reeder, G.D., Williams, K.D., 2013b. When do we ostracize? Soc. Psychol. Personal. Sci. 4 (1), 108–115. https://doi.org/10.1177/1948550612443386.

Williams, K.D., 2009. Ostracism: a temporal need-threat model. Adv. Exp. Soc. Psychol. 41, 275–314. https://doi.org/10.1016/S0065-2601(08)00406-1.

Williams, K.D., Jarvis, B., 2006. Cyberball: a program for use in research on interpersonal ostracism and acceptance. Behav. Res. Methods 38 (1), 174–180. https://doi.org/10.3758/BF03192765.

Williams, K.D., Nida, S.A., 2011. Ostracism: consequences and coping. Curr. Dir. Psychol. Sci. 20 (2), 71–75. https://doi.org/10.1177/0963721411402480.

Yuchang, J., Junyi, L., Junxiu, A., Jing, W., Mingcheng, H., 2019. The differential victimization associated with depression and anxiety in cross-cultural perspective: a meta-analysis. Trauma Violence Abuse 20 (4), 560–573. https://doi.org/10.1177/1524838017726426.

Zadro, L., Boland, C., Richardson, R., 2006. How long does it last? The persistence of the effects of ostracism in the socially anxious. J. Exp. Soc. Psychol. 42 (5), 692–697. https://doi.org/10.1016/j.jesp.2005.10.007.

Zadro, L., Williams, K.D., Richardson, R., 2005. Riding the 'O' Train: comparing the Effects of Ostracism and Verbal Dispute on Targets and Sources. Group Proc. Intergroup Relations 8 (2), 125–143. https://doi.org/10.1177/1368430205051062.